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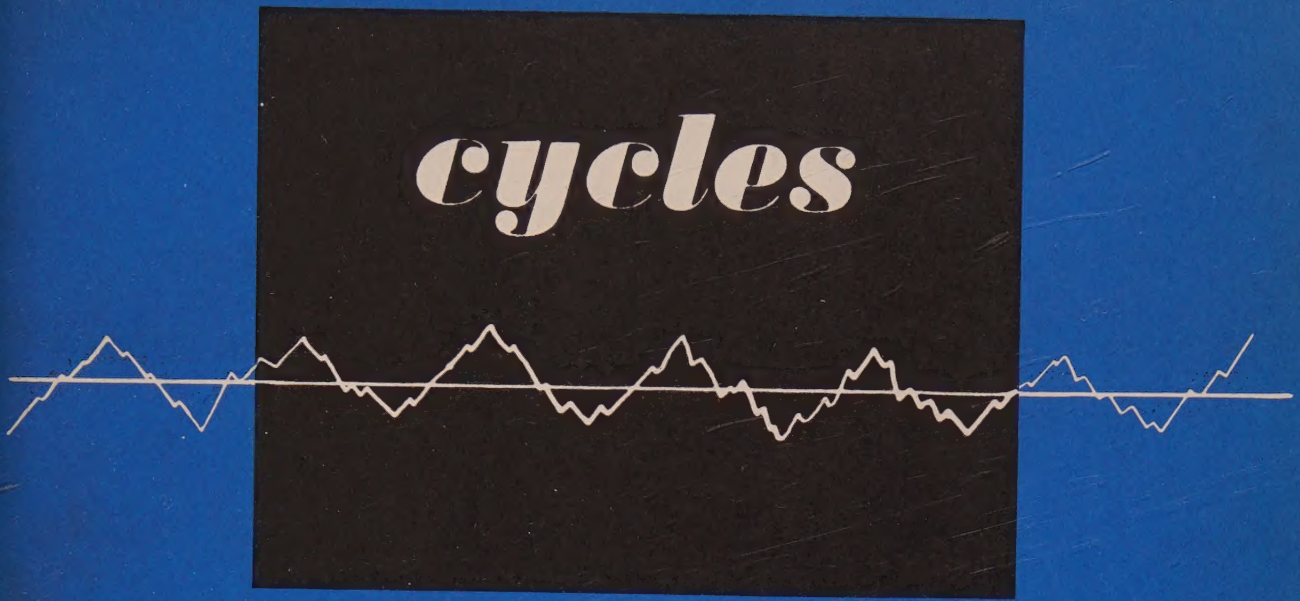

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Cycles are only *one* of the forces you must consider if you are attempting economic forecasting.

If you ignore the cycles you run the risk of serious errors.

But unless you study and weigh all the *other* forces that, in addition to cycles, combine to create economic change, you will make grave mistakes.

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IRECTOR'S ETTER. . .

ear Member:

A friend of mine recently sent me a copy f "Finagle's Laws," and I enjoyed it so much iat I want to pass it along to you. Copies f the article were passed around at a meeting friend attended, and I am reprinting it ere with some editing because of space limi- ations. I hope it tickles you as much as it id me.

inagle's Laws

We are grateful to John W. Campbell, Jr., litor of *Astounding Science Fiction,* for ringing this work to our attention, and to ie many readers of that magazine who collect- l and contributed samples so that others ght share in their experience.

n Experiments:

The first four laws are the only ones digni- ed by number. Note the beauty and simplicity the First Law. Also note that the remaining ree laws refer to man's reaction to Nature— t to Nature itself.

rst Law: If anything can go wrong with an periment, it will.
cond Law: No matter what result is antici- ted, there is always someone willing to ke it.
ird Law: No matter what the result, there is ways someone eager to misinterpret it.
Fourth Law: No matter what occurs, there is always someone who believes it happened according to his pet theory.

The Rule of the Too-Solid Goof: In any collection of data, the figure that is most obviously correct—beyond all need of checking—is the mistake.
Corollary I: No one whom you ask for help will see it either.
Corollary II: Everyone who stops by with unsought advice will see it immediately.

A further series of rules—or really advice to experimenters—has been formulated. They are a natural consequence of the first four laws, reduced to day-to-day practice.

Experiments must be reproducible—they should all fail in the same way.
First draw your curves; then plot the readings.
Experience is directly proportional to equipment ruined.
A record of data is useful—it indicates you've been working.
To study a subject best, understand it thoroughly before you start.
In case of doubt, make it sound convincing.
Do not believe in miracles—rely on them.
Always leave room to add an explanation when it doesn't work. (This open-door policy is also known as the Rule of the Way Out.)

Human Foibles

The remaining rules outline the human problems that follow from the above. To some extent they represent man's reaction to Nature and, even more aptly, man's reaction to man.

Laws of Revision: (Often lumped into the Now They Tell Us! Law)

First Law: Data necessitating a change of design will be conveyed to the designer after—and only after—the plans are complete.
Corollary I: In simple cases, where one obvious right way is opposed to one obvious wrong way, it is often wiser to choose the wrong way right off. This is one step ahead of choosing the right way, which turns out to be a wrong way, which has to become a right way.

Second Law: The more innocuous the revision appears to be at first, the further its influence will extend, and the more plans will have to be re-drawn.

Third Law: If, when the completion of a design is imminent, field dimensions are finally supplied as they actually are instead of as they were meant to be, it is always simpler to start all over.

Fourth Law: Even if it is impossible to assemble a part incorrectly, still a way will be found to do it wrong.

Corollary I: It is usually impractical to worry beforehand about interferences—if you have none, someone will make one for you.

The Law of the Lost Inch: In designing any type of construction, no overall dimensions can be totalled correctly after 4 P.M. Friday.
Corollary I: Under the same conditions, if any minor dimensions are given to 1/16th of an inch, they cannot be totalled at all.
Corollary II: The correct total will be self-evident at 9:01 Monday morning.

Deliveries that normally take one day will take five when you are waiting.

When adjusting (or drawing or computing, etc.) remember that the eye of the chief inspector (engineer, draftsman, etc.) is more accurate than the finest instrument.

After adding two weeks to a schedule for unexpected delays, add two more weeks for the unexpected unexpected delays.

In any problem, if you find yourself doing an unending amount of work, the answer may be obtained by inspection.

Finagle's Creed: Science is Truth—don't be misled by facts.

Finagle's Motto: Smile—tomorrow it will be worse.

The Finagle Factor:

A mathematical notation of Finagle's work has also been developed. Here, however, there seems to be some confusion, because two other names enter the picture; fudge and diddle factors are also used to considerable advantage by scientists and engineers.

Years ago—when the universe was relatively easy to understand—the Finagle factor consisted of a simple additive constant (sometimes known as a variable constant) in the form:

$$x' = K_F + x$$

Where any measured variable, x, could be made to agree with theory, x', by simple addition of the Finagle factor, K_F.

Later difficulties couldn't be solved so easily and so a fudge factor, K_B, was added.

$$x' = K_F + K_B x$$

Powerful as this adjustment was, World War II studies in servo theory indicated a need for a still stronger influence. The diddle factor, K_D, was born and made to multiply the quadratic term.

$$x' = K_F + K_B x + K_D x^2$$

It is felt that, at least at present, reality can be made to conform to mathematical theory with reasonable agreement on the basis of these three factors.

However, John W. Campbell feels there is a different basic structure behind the Finagle, fudge and diddle factors. The Finagle factor, he claims, is characterized by changing the universe to fit an equation. The fudge factor, on the other hand, changes the equation to fit the universe. And finally, the diddle factor changes things so that the equation and the universe appear to fit, without making any real change in either.

For example, the planet Uranus was introduced to the universe when Newtonian laws couldn't be made to match known planetary motions. This is a beautiful example of the application of the Finagle factor.

Einstein's work leading to relativity was strongly influenced by the observed facts about the orbit of Mercury. Obviously a fudge factor was introduced.

The photographer's use of a "soft-focus" lens when taking portraits of women over 35 is an example of the diddle factor. By blurring the results, photographs are made to appear to match the facts in a far more satisfactory manner.

* * *

Here, as developed by John Campbell and his readers, you have *Finagle's Laws.* Keeping a copy of it in front of you should serve to make you a charter member of the Society for the Prevention of Taking Yourself (and Other People!) Too Seriously.

Cordially yours,

Edward R. Dew

Executive Directo

ditorial: The Status of Cycle Study

eprinted from an "Editorial" in the April JOURNAL OF CYCLE RESEARCH)

by E. R. Dewey

All cycle study should start with the asumption that the observed rhythm is the esult of chance. This assumption does not ean that the successive *waves* are the result f chance. It does mean that the tendency of nese successive waves to recur at reasonably egular time intervals should be considered as ccidental until they prove themselves to be therwise.

Suppose that in some particular instance ne rhythm *has* repeated enough times and with nough regularity so that it *can* be considered ignificant. In this event the assumption hould be made that the rhythm is the result f forces inherent *within* the system involved -that the cause is endogenous.

Only in those instances where neither nance nor an endogenous cause are sufficient o explain the behavior, are we justified in ssuming that the cause of the cycle is exteral to the system involved—*i.e.*, that the ause is exogenous.

xogenous Cycle Relationships

The *raison d'être* of cycle study as such is he assumption that there *may* be, in certain nstances, exogenous cycle relationships. If here are, there is much greater chance of oticing them as a result of cycle study that ranscends the boundaries of the separate disiplines. If there is, let us say, a 2-year ycle in weather that creates a corresponding -year cycle in business, the presence of the usiness cycle is not likely to be known to he climatologist; nor vice versa. The disovery of an exogenous cause is even more ikely to be missed if the external force is ot even known.

Admittedly, the discovery of forces not now nown to science is highly improbable. Yet, if uch forces exist, how could we know of them xcept through their effects? How can we know f *any* force, for that matter, except through ts effect? Are not the magnetic "lines of orce" merely postulations to explain the ehavior of the compass? And if there are orces of long wave lengths acting upon human eings in the mass, how could we learn of such ehavior until we had records extending over ong periods of time?

Not only, *a priori*, is the discovery of hythmic forces not now known to science ighly improbable, but any theory relative to such forces has hard sledding. Ignore for the moment what these forces are, how they could originate, how they could be transmitted, how they could affect terrestrial affairs. Just make the raw unsupported assumption that such forces exist.

The first difficulty we run into (in addition to those already named) is the fact that if there were such waves they would be so weak that they would be unable to effect any chemical or electronic change whatsoever, in human brains or otherwise. We would then have to say that life and emotion can be affected directly by such forces. This of course might be so, but in that event we would have to rule out any concomitant effect on the weather or any nonliving phenomena.

One way around this difficulty would be to suppose, not ultra-long waves, but ordinary short waves that are more frequent at one time than at another. Such short waves are known. Moreover, they do come more frequently at one time than at another—in rhythmic cycles, incidentally—but there is no evidence that I know of to suggest wave lengths in terrestrial affairs corresponding to the cycles observed, or vice versa.

Pass lightly over these objections. Assume that "somehow" there are such forces external to the earth, or at least to the phenomena on the surface of the earth. There would have to be many such forces because many wave lengths have been observed. This brings us to another difficulty. Why is it that some of these phenomena "respond" to one of these wave lengths, other phenomena "respond" to other wave lengths, and still other phenomena "respond" to several wave lengths simultaneously?

And finally, how is it that the same cycle seems to crest later and later as found from either pole toward the equator?

To Summarize

There are no known causes that could produce rhythmic cycles, no known mechanisms by which the unknown causes (if they exist) could operate, and no known reason why the unknown causes (if they exist) operating through the unknown mechanisms (if they exist) should affect various phenomena selectively, by kind of animal, by latitude, and, in the case of human beings, by kind of activity!

Assuming then that the case of cycles

forced by mysterious external forces is dead, (but we shall see later that it will not die), what is the residual use of cycle study as such? The answer is fourfold.

Uses of Cycle Study

First, it can devise better methods for the detection, isolation and evaluation of rhythms. More particularly it can devise methods by means of which significant and random fluctuations can more readily be distinguished from each other. It can apply these methods to the various known fluctuations. It can thus separate those fluctuations that need to be explained from those that may safely be ignored —at all events for the time being.

Second, if the results of the work are properly published, it can call attention to non-chance rhythms within a single discipline, if there are such, and thus stimulate the workers in that field to discover (or invent) explanations.

Third, it can call attention to identical rhythms in different disciplines, and thus to possible interdisciplinary correspondences that would not otherwise be noticed.

Fourth, by merely recording examples of rhythm, it can provide the basis whereby later students can more easily separate the significant from the chance variations. The acid test for any rhythm is its ability to persist after discovery (or in prior data). Obviously, for this test to be applied, the cycle must first be discovered and recorded.

Back to the Beginning

It thus appears that cycle study, soundly conceived and soundly conducted, does have value even if no mysterious hidden forces are discovered. Such study can call the attention of workers in the various fields to significant —i.e., non-chance—rhythms that require explanations.

All of this brings us back full circle to the notion that I said would not die—namely the idea that some of the rhythms we observe are neither chance nor endogenous, but result from mysterious external forces awaiting discovery. Having been so convincingly killed, why will the idea not go and decently bury itself? There are several reasons:

(1) How could an *endogenous* rhythm reassert itself after a major distortion *in step with its old pattern?* Stop a pendulum clock. Start it again. The new ticktocks will have the same period (wave length) as the old, but it is most unlikely that they will be in phase— in step—with the original beat. Yet rhythmic cycles do revert to the old phase.

(2) How can a purely endogenous rhythm persist over a really long period of time? Take as an example the 16 2/3-year rhythm in wrought iron prices in England from 1277 to date. How could an internal pattern of supply and demand persist rhythmically for almost 700 years? But the pattern does persist. This fact is hard to explain unless there is an external force—metronome—to which these prices respond.

(3) It is conceivable, for example, that weather could affect business. But it is utter nonsense to assume that lynx abundance in Canada could affect business or any aspect of business, or vice versa. The fact that lynx and certain aspects of business both fluctuate in a rhythm of exactly the same wave length suggests an external force common to both.

(4) It is even harder to explain why the respective waves *synchronize.* This tendency of cycles of the same wave length to crest at approximately the same time could, in one or two instances, be the result of chance, but why is it that this behavior is *universal?*

(5) As I said above, one can imagine that weather might influence business, but if so, would you not expect the *overall* temperature or rainfall, or barometric pressure, or what not, to do the influencing? Why would you find a particular rhythm, minor for each, to be present in both, unless in both instances the rhythms were the result of a common cause? If there is a common cause, what could it be?

(6) Unless rhythms of the same wave length are caused by an external force, why would they show geographical patterns?

(7) If rhythms were endogenous, we would expect wave lengths to scatter more or less uniformly over the entire spectrum. They do not. They bunch at certain particular periods (wave lengths).

(8) The particular wave lengths that we find are often simple multiples or fractions of other wave lengths, or at least seem to be. This characteristic of rhythm would be rare if each wave length were separately generated.

Well then, even if (i) cause, and (ii) mechanism and (iii) the reasons for selectivity, are unknown, why bother about such matters for the moment? Why not simply postulate a Z factor—i.e., external rhythmic forces of a variety of wave lengths—and let it go at that? Because our postulated Z factor becomes credible only if we can answer "yes" to the llowing questions.

1. Are our observed rhythms statistically ignificant?

2. Do these non-chance rhythms revert to he old timing after distortion?

3. Are those rhythms that seem to be of the ame wave length (particularly when the phe-omena are obviously unrelated) really of the ame wave length?

4. Do non-chance rhythms of the same wave ength really evidence geographical patterns?

5. Is there really a concentration of wave ength?

6. Do non-chance rhythms of the same wave ength have a concentration of phase i.e., iming of crests and troughs?

7. Are there really "families" of cycles?

After all this has been done, our Z factor ypothesis will have become more tenable, ut without some theory as to cause and mecha-sm it will still not receive acceptance.

What could the cause be? If latitudinal assage is a reality, the cause must be something in the last instance associated with conditions on earth. If latitudinal passage is not a reality, the cause could be inherent in the space in which the earth is bathed.•

In either event the *ultimate* cause would probably be exterior to the earth. Among the possibilities would seem to be the heavenly bodies, galactic forces, or forces from outer space. Galactic forces or forces from outer space would probably have to be merely postulated. On the other hand, if the ultimate cause were to lie in the solar system, it should be possible to get associations capable of very exact measurement. Rhythmic cycles in solar phenomena coming at the same time as rhythmic cycles of corresponding wave length here on earth would add greatly to the credibility of our terrestrial cycles. Planetary associations would be provocative, but in the absence of some explanation as to how they could work, would be regarded with more skepticism.

Our program is basically simple: (i) show that the observed rhythms cannot reasonably be chance or endogenous, (ii) try to find associated astronomical or other possible causes, (iii) come up with a theory to explain the behavior as a practical matter. The program is a sizable one.

P.S. Does your organization have some spare computer time that could be contributed to the solution of some of the above problems? Please say yes!

he 3.864-Year Cycle in Tree-Rings

by Leonard W. Wing

In 1957 I reported the length of the domi-ant cycle in Norwegian Lemmings as 3.862 ears, the best that could be done by the time hart technique. Later I reported latitudinal assage in Lemmings and other rodents of North merica, attuned beyond random behavior to the ave length and timing of the Norwegian Lem-ings. The wave length of 3.862 years was but first approximation, though the best that as possible from the Lemming records.

The next step is to test this wave length n long records, the closeness of measurement eing related to the length of record. Tree-rings offer the best available long quantitative records of the past. Yet one can hardly be sure always that the length which he isolates in tree-rings is the same as the one in some other phenomenon, such as the Lemming outbreaks. There is also the matter of ring accuracy—some years may have double rings, some years may show none. The matter of ring

*This article is excerpted from "The 3.864-Year Lemming Cycle and Latitudinal Passage in Temperature," which appears in the April 1961 issue of the *Journal of Cycle Research*.

counts has been dealt with by ring experts, who recognize the problem.

At the Tree-Ring Laboratory of the University of Arizona, I obtained a number of reliable records through the cooperation of Dr. Terah L. Smiley and others. Their courtesy is most gratefully acknowledged. I have chosen the published record of a Limber Pine in the Snake River drainage near Ketchum, Idaho, measured by the late Dr. Edmund Schulman. The record begins with 727 and continues to 1951, a span of 1225 years. As far as I can determine, the site is at 43.6° North, 114.4° West.

If there is a 3.684-year cycle pulse with latitudinal passage, it should appear in this tree-ring record sometime *after* its appearance in the Lemming outbreaks which occur further north, at 64.5°. (Latitudinal passage is the tendency for cycle peaks to occur later and later as the cycle is found moving from the pole toward the equator—Ed.) The appearance of this cycle pulse in the Snake River rings ideally would be about 7 1/2 months later. We can test this lag in timing, once the wave length is established.

I set up a 3.862-year table of the tree-ring figures (after some necessary computations), and it indicated the wave length as longer by some 0.002 years. Accordingly I then set up a 3.864-year table. The halves of this table are shown in Figures 1 and 2. The entire table is averaged in Figure 3. The wave length may be considered as 3.864 ± 0.001 years.

Figure 3 gives a calendar time of high as 1952.150 and forwards and backwards at 3.864-year intervals. The low will be 1954.082.

The Lemming timing of high at 1929.6, brought up to date in multiples of 3.864 years gives the timing of high as 1952.784, which is the calendar timing of 1953.284.

This timing of the Lemming cycle is 0.798 years before the timing (low) of the tree-rings. The theoretical latitudinal passage of the cycle pulse between the Lemmings' site and the tree-ring site would be 0.634 years. It differs but 60 days from the actual as shown, which is close indeed.

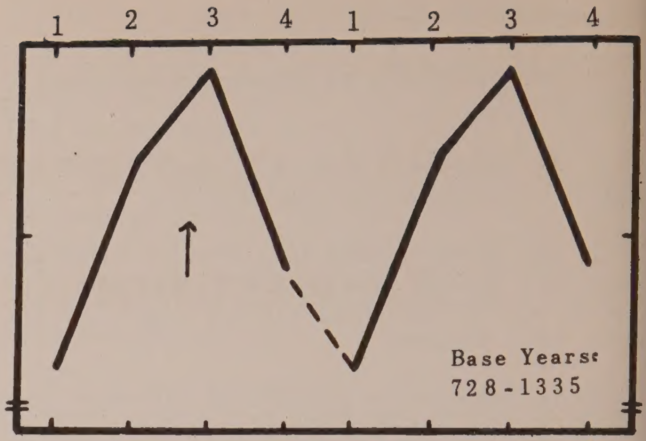


FIG. 1: First Half of the Tree-Ring Data

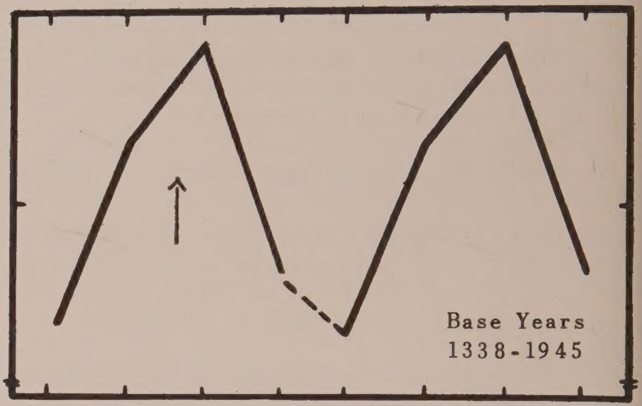


FIG: 2: Second Half of the Tree-Ring Data

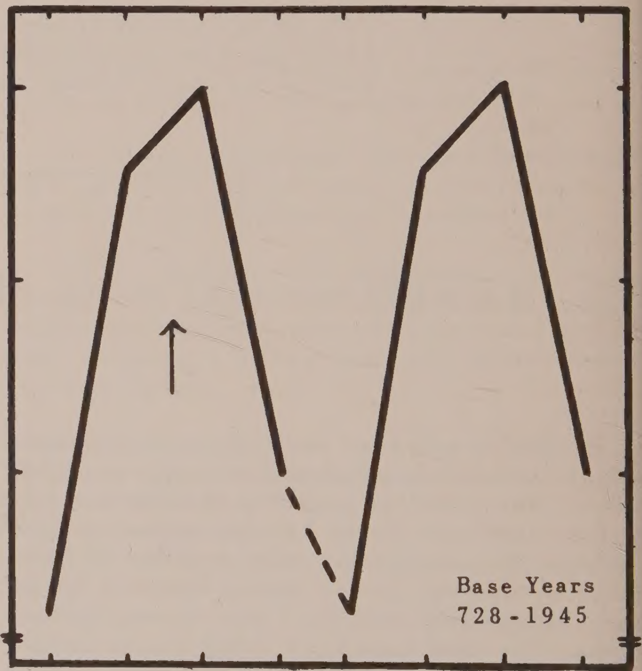


FIG. 3: Average of Entire Table—Tree-Ring Data

A POSSIBLE 17.63-WEEK CYCLE IN WESTINGHOUSE ELECTRIC STOCK PRICES

by Gertrude Shirk

We have isolated a 17.63-week cycle in the past performance of the price of Westinghouse Electric common stock. This cycle operates in addition to, or in combination with, the 32-week cycle we previously reported in these figures. The 17.63-week cycle has had an average strength of 101.4% of trend at the crests, and 98.6% of trend at the lows. A current critical date on the average cycle is an ideal high at the week ending May 19, 1961. The next critical date is a low at the week of July 21, 1961. These dates do not refer in any way to the actual price of the stock, but are average dates of turning points on this cycle only.

A picture of the ideal wave is shown in Figure 2 on the next two pages. The actual price of the stock is of course determined by many factors in addition to the minor force exerted by this one cycle. Another of the *cycle* factors is the 32 week cycle, and Figure 2 shows (in addition to the 17.63-week cycle alone) the combined 17.63 and 32-week cycles. The combined line shows the average past behavior of the two ideal cycles together. As you can see, the 32-week cycle has been the more important of the two. Our interest, of course, is in whether the cycles are real, significant, and continue to operate. One way to evaluate the cycles is by comparing them to the past actual data. A better way is to watch how well they operate in the future, or after the time they were first postulated.

Figure 1 below sets up the course of the combined 17.63- and 32-week cycles (when added to an underlying trend) for 1961. Please understand, the "course" shown below is not a forecast—it is an extension of two cycles and trend. The extension is made solely to enable us to check whether or not the cycles

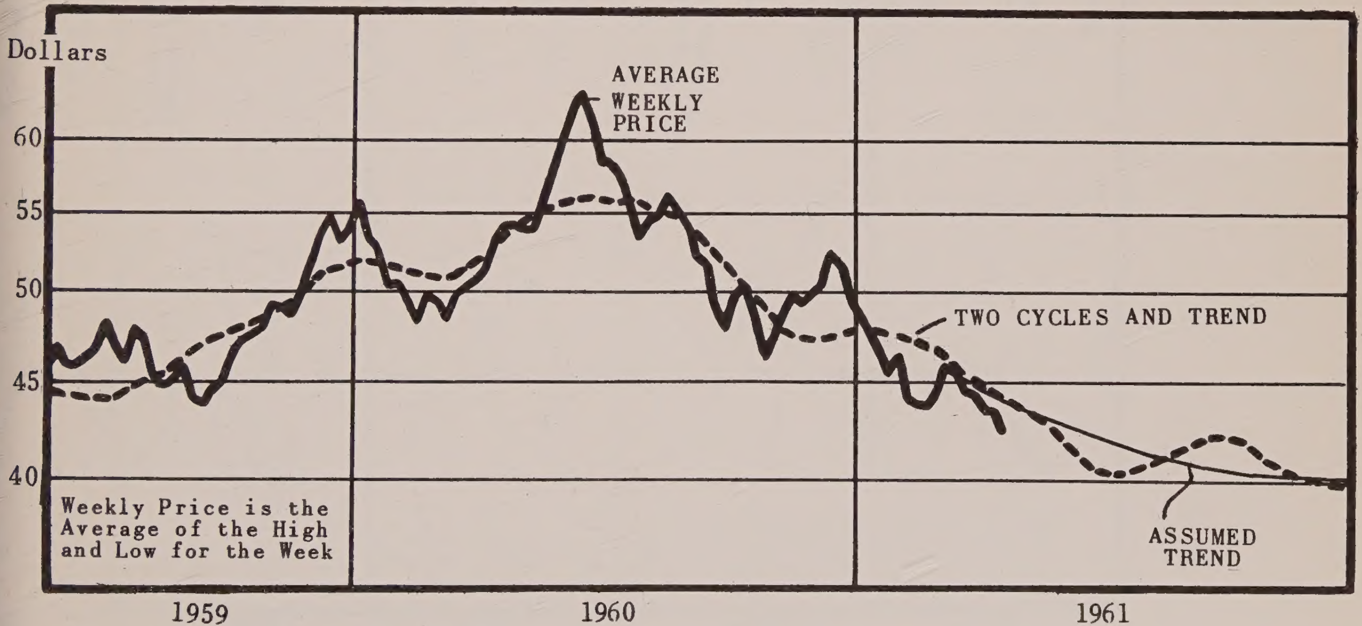


Fig. 1: THE ACTUAL PRICE OF WESTINGHOUSE ELECTRIC STOCK COMPARED TO THE COMBINED CYCLES AND TREND

continue to operate in the future. The ideal cycle high at the week ending March 3 is not too apparent in the actual figures. To be precise, it is missing, and the actual price was down rather than up.

The next following ideal low (based on average past experience) at the week ending June 23 is shown on Figure 1 as the dip in the broken line about the middle of 1961. The thin smooth line going to the end of 1961 is the trend I used, and the two combined cycles are wrapped around this trend. The combined ideal cycle line dips below the assumed trend at the time of low, and rises above the trend at the time of high.

If the trend I have used is too low, if the trend should go up to the $45 level by the end of the year, the combined ideal cycle line will fluctuate around the higher level, but the low will still be below the trend and the high will still be above the trend. At the ideal low at the week ending June 23, the combined downward force of the two cycl is minus 3.6% of trend. At the next followi high at the week ending October 13, the com bined upward pressure of the cycles is plu 3.8% of trend.

If you think the underlying trend wil start to recover from the decline it has show since the middle of 1960, you can apply th above percentages to whatever trend level yo choose for the balance of 1961. Whatever actu ally happens will be a further check on th reality and significance of these cycles.

A comparison of *past* actual prices wit the turning points shown by the combined idea cycles is made in Table 1. Showing such table may be taken by some to mean that thi cycle knowledge is intended as a basis fo action. We are *not* suggesting that the cycle be a basis for trading—rather we are checkin out the cycle performance. At no time do w mean to imply "buy" or "sell" this or an security. This is not a "system," either. *I*

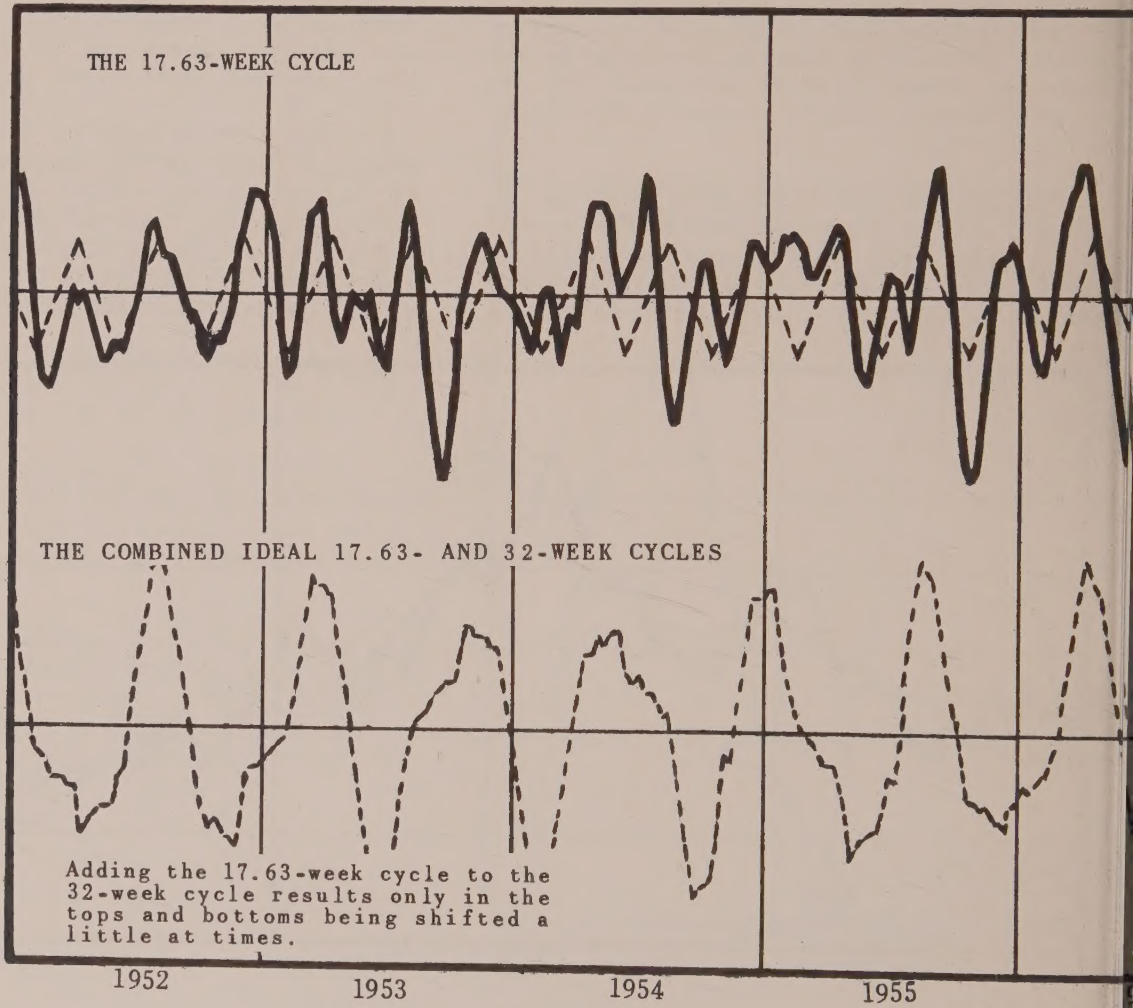


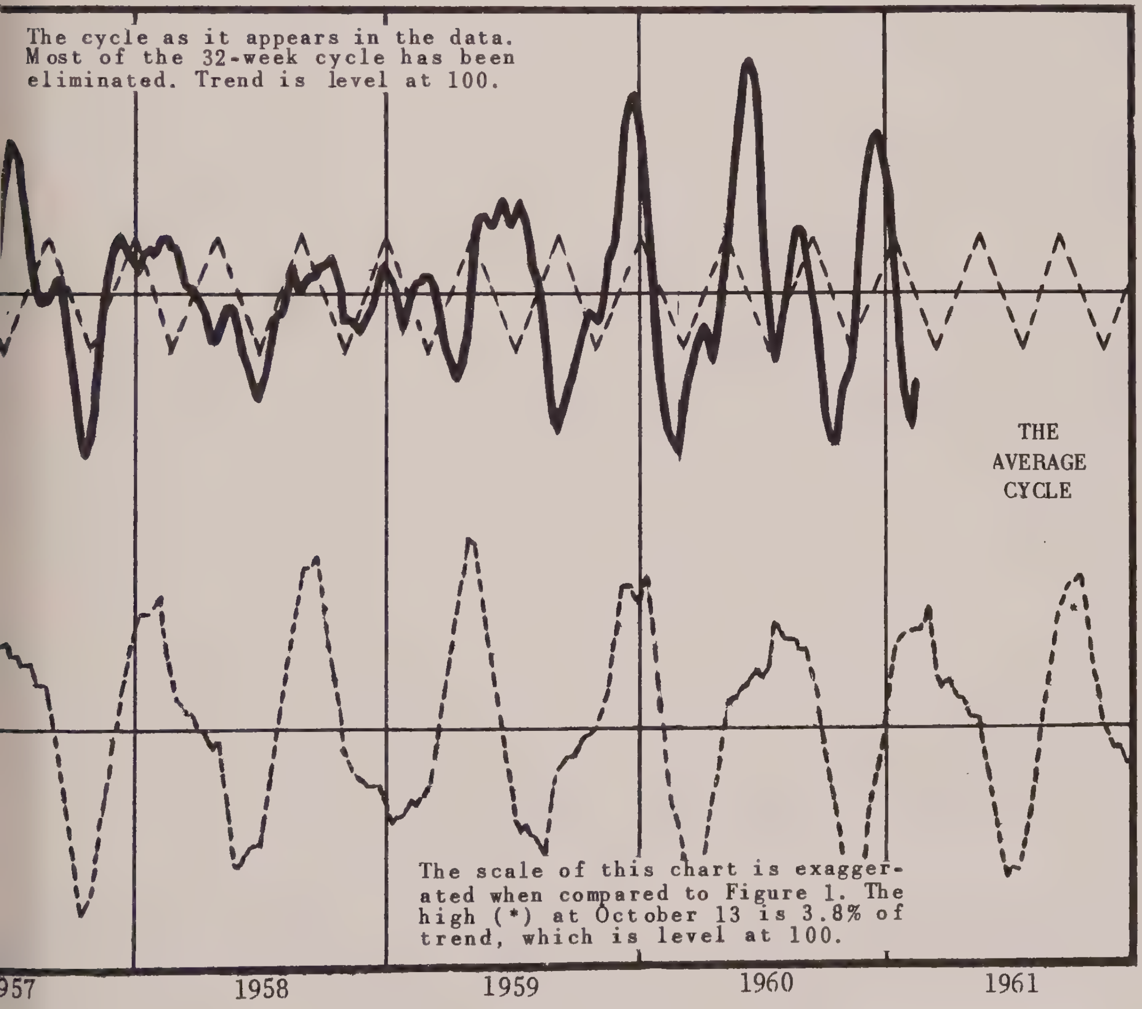
Fig. 2: CYCLES IN THE PRICE OF WESTINGHOUSE ELECTRIC COMMON STOCK

looking at the prices this way we are ignoring completely everything but these two cycles—hardly a sound or even rational approach to so complex a problem as trading.

The last time we discussed this price series we showed the 32 week cycle alone. It had an ideal low in the week ending November 11, 1960. The next ideal high was in the week ending March 3, 1961. Prior to this cycle leg, low-to-high, there had been 14 previous low-to-high cycle legs during the period covered by our data. Of the previous 14 ideal up-moves, the actual data had *twice* gone down instead of up. During the November 11 to March 3 ideal up-move the actual data also went down. We now have, therefore, 15 low-to-high ideal cycle moves covered by experience. And now, during *three* of these ideal up-moves, the actual price went down instead of up. The odds that the price will really go up at the time of the next up-move have been reduced from 7 to 1 to 5 to 1, assuming the pattern continues into the future.

The next critical date on the *combined* cycle line is the week ending June 23. About that date it may be possible to decide whether the pattern is again operating visibly in the data. In the past, during the 15 down-legs of the cycle the prices have actually gone up instead of down 6 times. That is, the odds for the combined 17.63-and 32-week cycle operating on a down-leg, based on 1951 to 1961 experience, are 3 chances for to every 2 chances against.

A table showing the *past* performance of the combined cycles compared to actual prices is given on the next page. There is not much difference between this table and the one that was shown for the 32-week cycle alone. The addition of the 17.63-week cycle changes an occasional week of high or low, but the net result is about the same. In evaluating the table, remember that it is our check on the past performance of the cycles. Each time a new ideal high or low point is passed, the conclusion must be altered.



The cycle as it appears in the data. Most of the 32-week cycle has been eliminated. Trend is level at 100.

THE AVERAGE CYCLE

The scale of this chart is exaggerated when compared to Figure 1. The high (*) at October 13 is 3.8% of trend, which is level at 100.

Table 1: Westinghouse Electric Common Stock

Measurement of Reliability of Combined 17.63- and 32-Week Cycle
Based on Turning Points of Combined Cycles vs Actual Prices

	Date of Turning Point Week Ending Friday	Average Weekly Price	Short Transaction	Long Transaction	Cumulated Profit or Loss
High	December 14, 1951	$19.75			
Low	April 11, 1952	18.06	$1.69		
High	August 1, 1952	20.41		$2.35	$4.04
Low	November 21, 1952	22.63	-2.22		1.82
High	March 13, 1953	24.25		1.62	3.44
Low	June 26, 1953	22.16	2.09		5.53
High	October 23, 1953	23.50		1.34	6.87
Low	February 12, 1954	28.25	-4.75		2.12
High	June 4, 1954	34.25		6.00	8.12
Low	September 24, 1954	36.03	-1.78		6.34
High	January 7, 1955	39.78		3.75	10.09
Low	May 6, 1955	36.25	3.53		13.62
High	August 26, 1955	32.78		-3.47	10.15
Low	November 11, 1955	29.00	3.78		13.93
High	April 6, 1956	29.75		0.75	14.68
Low	July 20, 1956	27.41	2.34		17.02
High	November 16, 1956	26.94		-0.47	16.55
Low	March 8, 1957	27.44	-0.50		16.05
High	June 21, 1957	32.66		5.22	21.27
Low	October 18, 1957	28.84	3.82		25.09
High	February 7, 1958	32.28		3.44	28.53
Low	May 30, 1958	29.00	3.28		31.81
High	September 19, 1958	31.84		2.84	34.65
Low	January 9, 1959	36.19	-4.35		30.30
High	May 1, 1959	43.31		7.12	37.42
Low	August 21, 1959	44.69	-1.38		36.04
High	December 11, 1959	53.75		9.06	45.10
Low	April 1, 1960	50.50	3.25		48.35
High	July 22, 1960	54.81		4.31	52.66
Low*	November 11, 1960	48.75	6.06		58.72*
High	March 3, 1961	44.38		-4.37	54.35

*The previous table on the 32-week cycle in Westinghouse (March *Cycles*) went only to this point. Since then one additional transaction has been added. This table, which adds the 17.63-week cycle, shows a profit of $58.72 through November 11. The previous table showed a profit of $56.71 through November 11.

Note: Profit and Loss figures are before cost, taxes, dividends on short side, and assume short sales were possible; figures do not include dividends received on long side.

NEW YORK CHAPTER MEETING NOTICE

The New York Chapter will hold its monthly dinner meeting on Tuesday, June 20. That's right—June 20. The speaker will be Bradbury K. Thurlow, Vice President of Winslow, Cohu, & Stetson. His subject is: "Are There Qualitative as Well as Quantitative Cycles in the Stock Market?"

The meeting will be at the White Turke *Town House*, 260 Madison Avenue. The socia hour starts at 5:45; dinner is served at 6:3 Dinner is $5.00 per person. Please make you reservations with Mr. Paul H. Halladin, 2 Oakview Avenue, Maplewood, New Jersey.

ADVENTURES IN FORECASTING *

BY H. K. RUTHERFORD

In several articles appearing in *Cycles* under the above heading in months past, I endeavored to explore the proposition that an established fluctuation in a given series could be projected in such a manner as to provide useful forecasts of what was to follow. By fluctuation was meant a reasonably steady move in one direction, called a trend, and also the combination of two trends—up and down—comprising a complete cycle.

The present report outlines how the matter has been pursued and summarizes some useful observations. It will be limited to trend lines only, with an occasional reference to the complete cycle when it appears appropriate.

A Trend Line

The accompanying theoretical sketch, Fig. 1, repeats the explanation of the techniques used in the earlier articles and here.

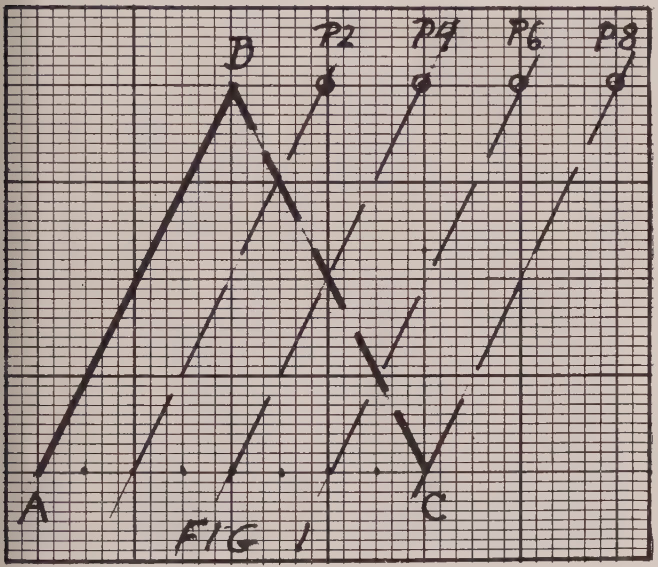


FIG 1

A-B is any trend, whether up as here or down, drawn through the extremes of the reversal at A and B in the curve and neglecting the many minor fluctuations along the way. Obviously, it is easy, by hindsight, to fix the A point but, as the trend develops, many minor reversals will appear, any of which may turn out to be the point B at which the long trend will terminate and our interest in forecasting begin. And it will be clear that accuracy in prediction depends largely on ability to determine the point B, whether it be as a result of a successful forecast from data prior to A or, belatedly, by observation of actual developments in the curve or waiting until we are sure a reversal of interest has occurred.

On a diagram, the *horizontal* A-B distance has been divided into 4 parts, and through these parts are drawn parallels to A-B. These parallels are labelled P2 and P4 here, the P1 and P3 being omitted to avoid confusion, but recognizing that they, too, may have value at times but less frequently than the P2 and P4.

Where the parallels reach the level of B, we have shown small circles which will be termed intersects as in the earlier articles *viz.*, P2 intersect, P4 intersect etc. It may be repeated here that an intersect is a timing device forecasting when action in the curve is to be expected and therefore deserving attention when it is reached.

It will be apparent that this simple procedure is one method of projecting the A-B trend by 1/4 fractions, both in timing as shown by the intersects and for level as given by the parallels. We have good support for the belief that a reverse trend does have a relationship to the preceding trend in the opposite direction. Thus, should the reversal proceed at the same rate as the advance, we would find the curve, at the P2 intersect date, at or near the P4 parallel, but how far this correlation could be expected to continue is the question.

In Fig. 1, no limit has been placed on the length of the trend A-B,—it may occupy days, weeks, years, according to the form in which the data are shown or the interest of the user. Thus the procedure is not merely a near-term method but is applicable as far ahead as is desired. So we are here exploring the extent to which past cyclical influences, as recorded in the fluctuations, may be expected to persist in the reverse direction.

The Forecasts

The following summarizes the results of applying the procedures of Fig. 1 to a large variety of actual situations, but reports only part of what could be written if the subject were covered fully. A casual inspection of almost any curve will show that an unlimited number of situations appear and these are best left to be worked out by the reader as a part of his education if he is interested in following the method. Nor will we have any dogmatic answers to give, but rather point out how certain useful information may be obtained for personal interpretation, with the caution

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that the observations should be considered as high probabilities rather than certainties.

General

1. The P2 and the P4 parallels and their intersects are the minimum techniques usually found necessary. By the time their forecasts have matured or before, a new trend will have been established which, unless minor, should be projected in turn as a forecast. In the event the curve should then present no definitive current trend, the earlier projection may be extended to the P6 and P8 parallels and intersects which often have functions similar to the others. As a rule, it is the *latest important trend* which should be used for projection. If its forecasts prove indefinite, a longer preceding trend is the dominant one and should replace the other.

2. Intersects predict dates when *action* in the curve is to be expected. That action is usually a reversal of the move immediately preceding the date. If, however, the curve is at the intersect (or the level of an important earlier resistance level) it will probably break through into new ground. But here caution is needed. No conclusive method has been found by which to determine just what action will be seen at a far-distant intersect, but it will become clear as the date is approached. And it may be added that successive intersects—*e.g.* P2 and P4—usually alternate in registering tops and bottoms, hence, knowing one, the other becomes better defined. And we may add, for emphasis, that intersect dates are important and, in many cases, conclusive of a reversal of trend.

3. Similarly, the parallels show objectives which the curve may be expected to reach when headed toward them. And, as for intersects, if one parallel is passed decisively, the next beyond becomes the objective. So, obviously, a clear failure of the curve to reach a parallel is often the earliest indication that a reversal is being made.

4. A development of high probability is that, at the P2 date, the curve will be at or near the P4 parallel. In other words, the reversal up to this point will have averaged closely the same rate as the basic trend. (It follows that the curve will be at the P2 parallel about the P1 intersect date.) This then may be considered "normal" development and emphasizes the significance of the P2 intersect and the P4 parallel where decisive action is quite common.

5. Reversals in the curve occasionally occur prior to the indications of paragraph 4, *viz.*, at or near the P2 parallel itself. If so, this is a most important indication that the long trend is only hesitating and will continue into new territory before making a climax. This is typical of growth situations. Thus, when the curve reverses *prior* to reaching the P4 parallel, the earlier trend will be resumed and probably continued for a considerable period. Note, also, that the P4 parallel, when reached, usually, but not invariably, sets the limit to the move then under way.

6. Another departure from normal development is that the curve may reverse steeply after B and reach an extreme objective, say the P3 parallel, at an abnormally early date, say at the P2 intersect time. Such action is probably caused by temporary influences, will soon be corrected and only provides another turning point which must be considered in our forecasts. But, the influence of the P2 intersect in calling a halt to such a move should not be overlooked.

7. Any parallel, even P4, is occasionally penetrated. If so, the next intersect following the penetration, whether P2, P3, P4 etc. is likely to date the end of that move whatever the level reached may be.

Practical Illustration

We now proceed to a practical application of the method discussed above, using for the purpose the curve of egg prices shown in the April issue of *Cycles*. It is realized, of course, that this series has a strong seasonal influence which adds to the regularity of development but is given no consideration in arriving at the forecasts. In fact, it has been found that seasonal influences in many commodities vary greatly in effect from year to year, but whatever that influence may be it is combined in the record and has its effect on the forecast as does any other rhythm.

Going now to the graph, in 1959 the P2 and P4 parallels are shown with their intersects, the basic trend for projection being from the top of Sept. '58 to the bottom of May '59, by hindsight the proper trend for the purpose. At the P2 intersect of Sept. '59, the high probability was that the curve would be on or near the P4 parallel, whether to reverse there or to continue through until the date of the next intersect remained to be seen. It actually continued through this level until the P2 intersect indicated that time was up. Then the P4 parallel was the trend until its intersect registered the time for reversal in Jan. 1960.

In '59, we have the first leg of a complete cycle—a trend of such importance as to warrant projecting as a forecast. The usual P2 and P4 parallels and intersects are shown and, as is almost invariable, we find, at the P2 date, that the curve is at the P4 parallel. Here the P2 intersect apparently signalled a break-through instead of a reversal and the penetration continued until the P4 intersect called for a reversal in early 1960. It appears then that this curve goes through the P4 parallels regularly and by small amounts and that the P4 date is significant.

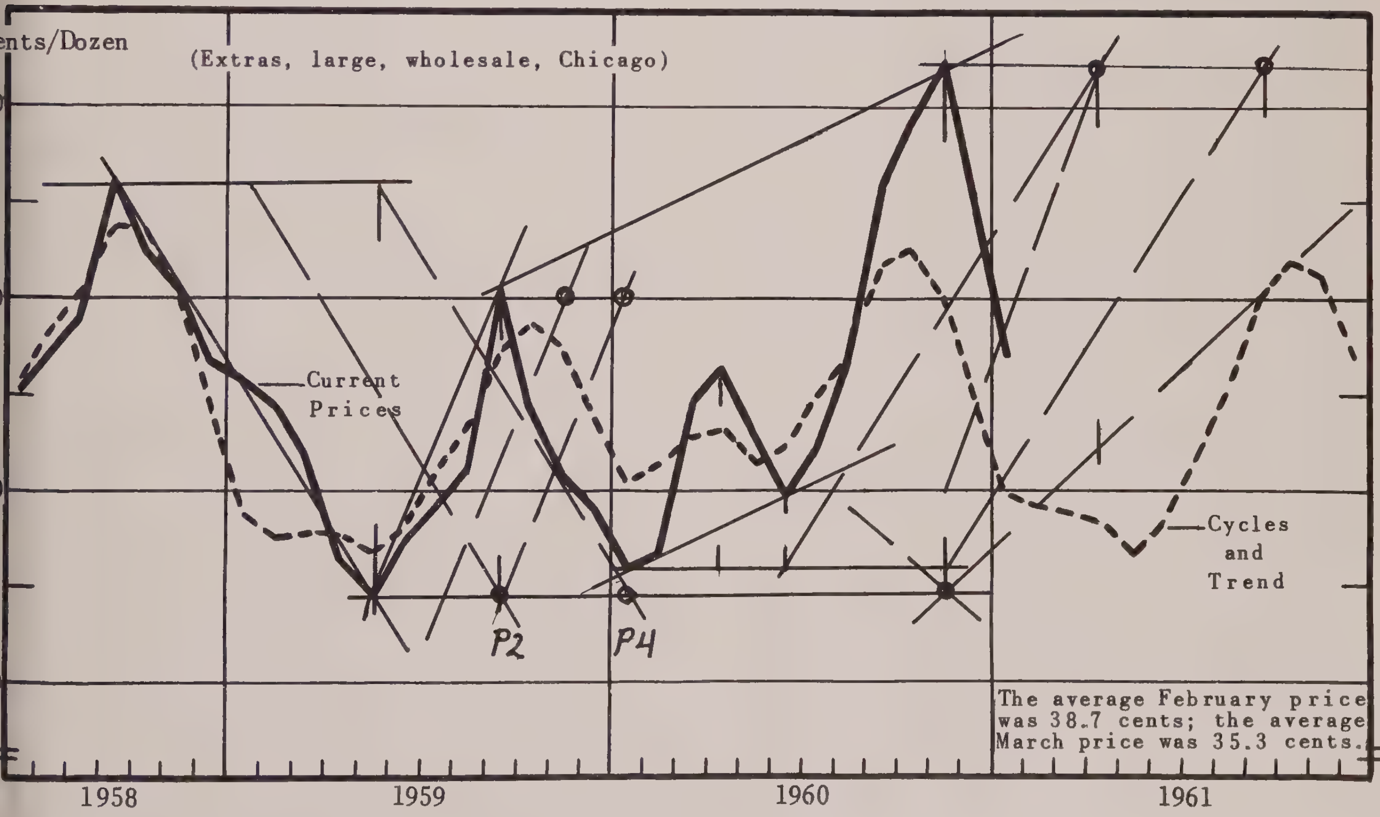
The preceding development serves to emphasize the earlier statement that intersect dates are critical and, since we cannot be certain what action will take place, observation of the final criterion—actual curve performance—is always advisable at times of which we have had warning and the importance of which has been suggested by the source from which the forecast has been obtained.

A projection of the final trend of '59 into '60 is omitted to avoid confusion. If interested, the reader will find that the early rally in '60 was quite well forecast but that the April peak was located by a P3 intersect rather than by the usual P2 or P4. Had one been interested in following more in detail, this variation would have been evident in advance. So also, the June bottom was dated by a P3 intersect obtained by projecting the trend ending in April. Here again, precision in forecasting depended upon observation of detailed performance when the intersects were warning of probable time for action in the curve.

On the assumption that one had been successful in picking the bottom of June '60, if he had not already done so in January, his interest now would be in how far the up-move might continue, although he would not take action until convinced that another reversal was being made. The Jan-June cycle-trend is strongly up and a parallel thereto through the April top as a first objective and finally the top of August '59 as the next were suggestive of the limit as the earlier P2 and P4 parallels were penetrated in succession. That the curve was headed for new high territory appeared when the P4 intersect, based on the April-June trend, showed the curve had rallied to the level of the origin of the trend *i.e.*, the April high. Such a development is common and usually, but not invariably, calls for a break-through.

For 1961

In forecasting for 1961, we have the P2 and P4 parallels shown, computed both on the final up-trend of '60 as well as on the overall up trend from January to November. It is interesting to note that the P2 intersect of the latter appears exactly at the P4 of the former—a not uncommon development at a climax.



The average February price was 38.7 cents; the average March price was 35.3 cents.

FIG. 2: RUTHERFORD TECHNIQUE APPLIED TO EGG PRICES

Our forecasts, based on the early moves in 1960 only, do not provide an intersect to date the end of the autumn rally which we know to be expected seasonally. Where the current predictions thus seem inconclusive, the use of a longer and probably more dominant trend is indicated. In this case, we have a top in late '57, not shown on this graph, and the extreme bottom of mid '59 as such a trend—two years long. The P4 parallel of this trend has its P4 intersect as shown in Nov. '60, thus disclosing what was the influence responsible for the extreme rise of late '60. Of course, this was not known until a lack of clues in early 1960 suggested that we had to go farther back to find the chief actor in this particular "Whodonit."

Now using the P4 parallel of the '59-'60 long trend as the guide, we find its level to be about 33 in April '61, at the date of the intersect, and would expect that this long-time objective would be difficult for the curve to penetrate.

In April '61, as this is being written, we have the important intersect derived as shown. On the assumption that it will be found close to correct, and without going into further detail, the conclusion seems justified that a bottom is being made and that the expected rally will proceed rather steeply until, about June, at the most current intersect date, the curve will be at the corresponding P4 parallel or about the 40 level. How much farther it would proceed prior to the top indicated for September may best await further developments but probably will not be far beyond 40.

On the assumption that the information obtained can be interpreted by the user, the proposed method has a number of advantages. Its forecasts focus attention on changes of trend, a knowledge of which is often all that is essential in predicting. And, once the reversal point of a given trend has been found, only a few minutes is required to make forecasts of probable developments days, months or years ahead according to the period occupied by the trend being projected.

Summary

On the assumption that the reader is interested in the type of information made available by the suggested procedures and is willing to do some work, the following would be routine.

1. Study the indications of change of trend as the most important continuing activity.

2. Having concluded that a reversal is being made, short term or long term depending on one's interest, locate the P2 and P4 parallels and intersects. Expect the reversal to carry the curve to the P2 parallel at least. If reversal actually occurs at or short of this objective, the preceding long trend will be resumed as part of a growth situation probably carrying into new territory. Occasionally, a very steep reversal takes place, carrying the curve to an extreme level at or about the P2 intersect date. If so, a vigorous recoil therefrom is to be expected.

3. By far the most common reversal is such as to carry the curve to the P4 parallel, usually, but not invariably, about the P2 date, the prerequisite being that it has already been able to penetrate the P2 parallel—a critical level as mentioned in 2 above.

4. Most probably, the P4 parallel will be the limit of the reversal. If penetrated decisively, however, the intersect following is likely to date the end of the move, whether it be P2, P3, P4 or some other intersect. And it may be added that if the P2 or P4 parallels are to be penetrated, any hesitation will not be long.

5. The indicated predictions will always be found to be warnings where one will do well to pause and to note the action of the curve as an interpretation and confirmation or denial of the action forecast by the method. All of the observations will be found valid at some time or another as the curve develops, but where any one of them will be more appropriate than another cannot be stated until the forecast date is approached and the pattern of progress becomes clear.

We may close with a word of caution for the neophyte. The facility with which predictions can be made under the method may tempt the user to become so enamoured with short term forecasts that the longer term perspective may be lost sight of and the results will be only confusion. It requires little discussion to demonstrate that the chief function of short-term forecasts is to pin-point time for action within an area pointed out by the longer-term forecast as that when an important development in the curve might occur.

Time and time again . . .

BY GUSTAV GUMPERT

Accidents Will Happen

"Injuries have always seemed to run in cycles, for reasons no one has ever adequately explained," says 50-year-old Dr. Hyman B. Copleman, physician to Rutgers University athletic teams.

Dr. Copleman says the cyclical effect holds true whether the injuries are blisters or pulled muscles, injuries to ankle, shoulder, or knee.

Of course the Biorhythm theory of accidents, according to which they happen at weak moments in the cell-life of the human, is one explanation that has been offered.

Assyrian Markets

A clipping from our file of ancient lore reminds us that the Assyrian culture was plagued by recurrent cycles of deflation and inflation, frequently connected with wars and famine. Money values fluctuated as they do this day, food prices went up and down, and the measures in which the grain was sold were made smaller in times of inflation.

Biological Clocks

Pioneer studies indicating that life processes are run by countless "biological clocks" may eventually provide valuable tools in the battle against cancer and other diseases.

The man who is heading these studies recently told the American Cancer Society's seminar for science writers that it may be possible to "reset" the internal clocks when more is learned about the way they operate normally and how they run wild in the uncontrolled cell multiplication of cancer.

Dr. Franz Halberg of the University of Minnesota Medical School reported that he and a group of associates have established that various life processes have their own rhythms.

This means, he said, that in the course of the 24-hour cycle by which human beings are governed there are peaks and troughs in resistance to disease.

In the case of cancer, the biological clock regulating cell division apparently goes haywire, so that more and more cells multiply without regard for the over-all bodily economy.

If the cells could be put back in cycle, Dr. Halberg apparently reasons, the course of cancer could be stopped.

Hunting Cycles

Jukka Koskimies of the Game Research Institute in Helsinki, Finland, has found a cycle in the abundance of game that he describes as unfailingly regular. As a result, he has recommended that hunting be adjusted to the cycle so that the animals will be left alone during the low of the cycle and hunted during the high.

This seems like a good idea to us—not only for Finland, but also for the U. S. Koskimies, by the way, says that he doesn't know the reason for the cycles in the abundance of game.

Harvard Says "No"

Among the other interesting tidbits from the past that we uncovered in going through these old files was an article from *Science* magazine by Harvard Professor Edwin B. Wilson (who was onetime President of the American Statistical Association). He said that financial forecasting just won't work.

He gives a number of convincing examples to show that if you work with stock prices, or any other business indicator, and try to learn from the past what is going to happen in the future, you will end up with a forecast which, in his words, has the merit of "just about zero."

Despite the difficulties involved in forecasting, we have all seen too many good ones for us to go along completely with such negative thinking. The discussion in this time and year centers around methodology.

The Market Place

May 1-5, up; 5-13, down; 19-28, down; 28, up.

LETTERS:

The Geisinger Indicator

Dear Mr. Dewey:
I have written you previously on some thoughts of mine concerning the Geisinger Indicator. This letter contains some more ideas.

I would like to refer you again to page 102 of the April issue and have you compare Chart E, the Modified Indicator, with Chart A, the Geisinger Indicator. You will note that the advanced Modified Indicator corresponds to the same timing cycle as the Indicator itself if you consider the upturn coming when the Modified Indicator cuts -6 on the downside.

Example: July or August 1949, April 1954; July 1958.

Contrawise, with the exception of January 1951, the Modified Indicator reaching more than plus 5 on the upside has signified the beginning of the end of the boom.

I cannot quite agree with you that it is encouraging that the Indicator has not gone as low as it did in 1949, 1954, and 1958. It would be encouraging if it had. Then it would mean that this is all over. We are reading (too) much optimism in the newspapers.

Cleveland, Ohio Orrin B. Werntz

Comment: We agree with you that the optimism in the newspapers may be premature. We have just started a second type of "indicator" to give us a further check on the outlook, and you might be interested in it. We have been doing this for just three months, so there has been no test as yet of its worth, but it seems logical. We look at the eight leading indicators (as determined by the National Bureau of Economic Research) and rate them as good (+1), neutral (0), or poor (-1). Then we total the result.

We did this January 31, March 1, March 29, and April 26. The score for these dates ran -1, 0, +1, and +3, consecutively. The best possible score would be +8. If all the leading indicators looked good, there would be more solid ground for optimism. *G. S.*

Depression

Dear Mr. Dewey:
I enjoy reading *Cycles* every month. . .(I believe) we are on the verge of the biggest industrial and financial crash in history. The dollar will become valueless and gold will go to unheard of astronomical prices.

County Sligo, Ireland Joseph H. Benjamin

Comment: Some day I expect a humdinger of a depression but so far I have not been convinced that we are experiencing the beginning of it at the present time. *E. R. D.*

* * *

Dear Sirs:
I have had (Benner's chart) for more than 50 years. . .it is pig iron production, but if you draw an opposite one you will have prices, or the highs and lows of our economy. We may have C.C. camps this year; a W.P.A. by July 1962.

Orlando, Florida C. W. Brooks

Comment: I have great respect for Benner's work but it is now a little out of step as his average nine year cycle is actually 9 1/5 years. *E. R. D.*

Worm Runners

The Worm Runner's Digest reports that if an ordinary flat worm is conditioned to expect a shock when a light is turned on, each half of the worm, and successive generations of each half will also cringe when a light is turned on.

This bit of experimental psychology is from a recent article in the *Digest*, and was sent along to us by Don T. Hastings, a member in Detroit.

"The *Worm Runner's Digest* is an unofficial, irregular, and informal journal of comparative psychology based on the motto that it is worthwhile to poke fun only at worthwhile things," says the editor, James V. McConnell, assistant professor of psychology at the University of Michigan, in the *University Record.*

A worm runner is someone who experiments with flat worms, and the *Digest* grew out of the widespread interest in the ties between heredity and learning, especially as exhibited by the nth generation of flat worms that still cringed at a light being turned on.

Copper Share Prices

Dear Mr. Dewey:

I would appreciate an extension of the Standard & Poor's Copper Share Price data published in the December 1960 issue of *Cycles.* It would be very helpful to know the indications for a year or two beyond the date given in the chart.

Taunton, Massachusetts J. D. Robertson

Comment: The combination of cycles and trend that is used as the calculated line on the Copper Shares Price chart is just too problematical for us to show it any farther into the future than we do.

We are waiting to see how well the actual Copper Shares Price Index performance matches the calculated line during 1961 before we make any farther extension. We feel that it is just too dangerous. *G. S.*

Speculators

Dear Mr. Dewey:

Some time back you critized stock market speculators, and commented that you felt they contributed no useful function. I think you should differentiate between the successful ones and the unsuccessful ones. Those who make money at it must be "buying low and selling high." In so doing they help to stabilize prices and prevent wider price swings. If they were not buying, prices would go lower on short term down swings, and if they didn't sell when prices are temporarily higher, prices would go even higher. I think the speculator provides a good example of capitalism at work. If he's good he makes money. If he isn't, he goes broke. Unfortunately, that isn't true of every job in our society.

Midland, Michigan J. D. Kaufman

* * *

Dear Sirs:

In your work, do you go so far as to give the cycles of individual stocks? And, if so, do you do this regularly for certain stocks.

Wooster, Ohio J. D. Overholt

Comment: We just recently started to include articles on cycles in individual issues. Of course, if we are not able to find something in every record we examine, we expect to report negative results as well as positive results.

Whatever series we report a cycle or cycles in (stock prices, egg prices, cotton consumption, hours worked, etc.) is reviewed and brought up to date from time to time in our "Round-Up" section. We hope to make about four issues a year all "Round-Up", and to review and summarize the economy in general, and in particular. *G. S.*

* * *

Gentlemen:

The writer does not have the time for the study of cycles for the love of it—nor the money for the purchase of literature which he does not have time for.

Therefore: What do you have which would enable me to speculate in stocks and/or commodities and/or Put and Calls with *safety.* I would expect this to require diversification, but how much diversification would be required?

I would expect losses but would demand an over all profit, and a handsome profit. . .at this time my chief concern is making money.

Knoxville, Iowa T. W. Stewart

Comment: I do not know of any easy way to make money. *G. S.*

* * *

Dear Sirs:

I would like to know just how you can help me to make money in stocks. When you study the cycles in stocks does the result tell you which securities to purchase and sell, and when to do this?

New York, New York J. Bernstein

Comment: We make no recommendations in regard to the purchase or sale of individual securities. I think the majority of our members use our reports to get background information, which protects them from unwarranted optimism or unwarranted pessimism. *E. R. D.*

The Cycle Workshop

RATIO LINE CHARTS

Last month we discussed arithmetic line charts. This month I would like to talk about *ratio* line charts. The difference between arithmetic charts and ratio charts is in the vertical scale.

An arithmetic vertical scale shows equal spaces for equal arithmetic differences between the numbers on the scale. A ratio scale shows equal spaces for equal *ratios* between the numbers on the scale. Consider the illustration called Figure 1.

On the arithmetic scale, by definition, and as illustrated on the chart, there is an equal amount of space between 0 and 10, between 10 and 20, etc. Regardless of how far up the page the scale goes, it will always show $10 difference for each quarter inch.

But, on the ratio scale each quarter inch represents an amount ten times as great as the one below it. The ratio of 1 to 10 is the same as the ratio of 10 to 100, which is the same as the ratio of 100 to 1000, etc. Each ratio, 1 to 10, in whatever terms, would cover the same vertical distance on the ratio scale.

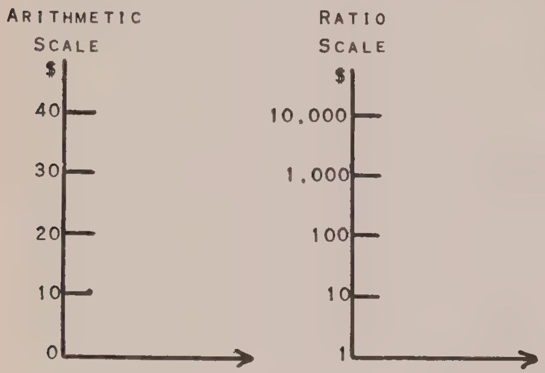


Fig. 1. The Arithmetic Scale and the Ratio Scale Illustrated.

On the ratio scale on Figure 1 there are four divisions, each ten times the other, so it is called a *four cycle* ratio chart.

The advantages of this ratio scale are evident. If a series includes numbers as low as 10, 20, and 30, and also as high as 1000, 3000, and 500, and if you want to see the amount of fluctuation in both groups you cannot do it on an arithmetic chart unless you use wallpaper. To get 3000 in the vertical scale and to get 10 and 30 in it also would require too high a scale.

Conversely, if you want to see an increase from 10 to 30 on an arithmetic scale, and on the same scale, see an increase from 1000 to 3000, the second increase will be a jump many times as great as the first, yet percentage-wise, the increase is the same.

On a ratio scale the increase from 10 to 30 covers exactly the same space on the chart as an increase from 1000 to 3000. The ratio scale shows schematically that 1 is to 10 as 10 is to 100.

A ratio scale can start with any number not zero because you cannot figure a ratio of zero. Several four cycle ratio scales are shown on Figure 2.

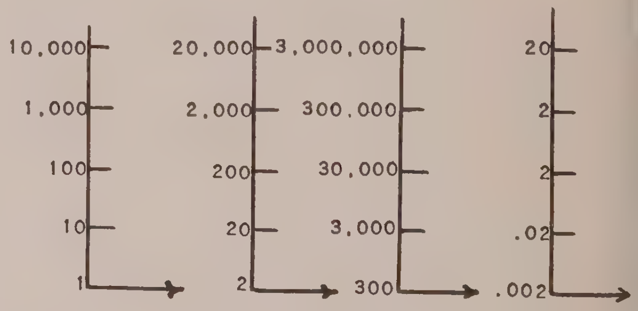


Fig. 2. Samples of 4-cycle ratio scales. Note that scales are *always* converted from one to another by multiplication—never by addition.

If you wanted to plot a series using the first four cycle scale of 1, 10, 100, etc., but had figures coming between the divisions of 1, 10, etc., you would not know where to put them.

The space between the divisions must in turn be divided so that the ratio scale is maintained within the cycle. There is a one cycle subdivision shown in Figure 3.

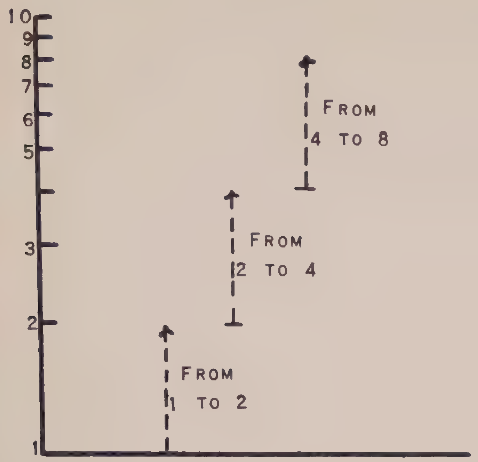


Fig. 3. Sample of 1-cycle ratio scale, showing subdivisions. Note that equal vertical distances represent equal percentage change.

You see by the scale that 1 is to 2 as 2 is to 4 as 4 is to 8—again equal distances represent equal ratios. If we add a second cycle on top of the one cycle shown in Figure 3, you will find that the distance from 8 to 16 is the same as it was from 4 to 8, etc. That is, the proportionality is maintained among, between, and within the cycles.

Figure 4 is a ruled sample of regular ratio paper. It shows two cycles vertically. You will note that the *horizontal* ruling is the polypurpose kind—the spaces can designate any time division (days, months, years, etc.) that you choose. Ratio paper is available with a variety of horizontal rulings.

At this point I should mention that ratio paper is also called semi-log paper, but the reason for this second name is part of a later article in this series.

The scale that it used on Figure 4 covers two cycles, the first from 1 to 10, and the second from 10 to 100. When you examine the subdivisions within the cycles, you will find that the values of the subdivisions change. These changes have to be watched carefully to avoid errors in plotting.

The accented line between 1 and 2 on Figure 4 has the value 1.5. That is, the subdivisions between 1 and 2 read 1.1, 1.2, 1.3, etc., up to 2. Looking farther up the scale to the subdivisions between 5 and 6, the values of the lines read 5.2, 5.4, 5.6, and 5.8.

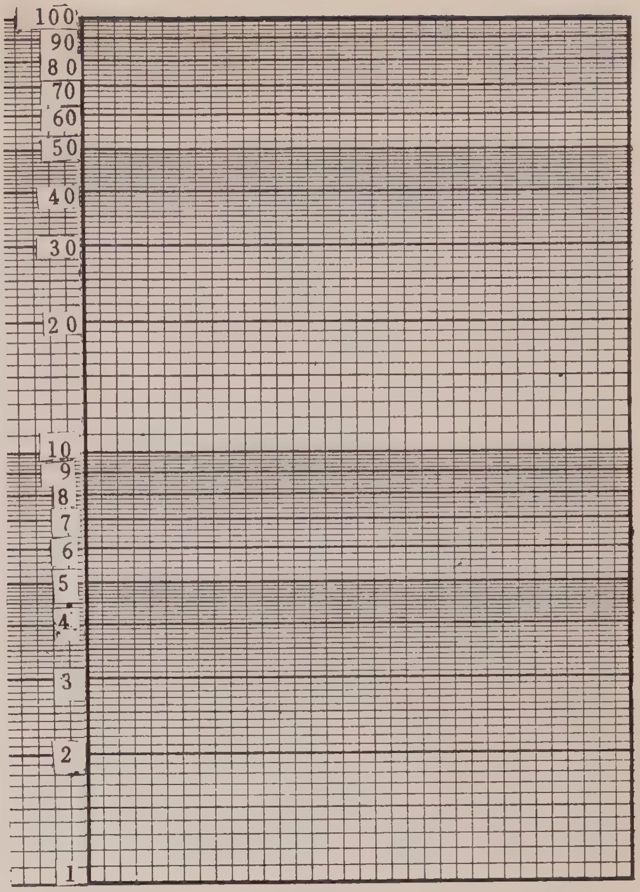


Fig. 4: Sample of regular ruled ratio paper with polypurpose horizontal ruling and two cycles vertically. Note that the vertical scale changes.

In the second cycle, the subdivisions between 10 and 20 read 11, 12, 13, etc., whereas the subdivisions between 50 and 60 read 52, 54, 56, and 58. You have to keep track of the changing scale when using ratio charts.

In setting up a ratio chart you select first the number of cycles that is needed to cover the range of the data you are using. Then you set up the appropriate scale.

Suppose, for instance, that your data ranged from 2 to 200, and that it is important to use a ratio scale. You select two cycle paper, and set up a scale with the first cycle going from 2 to 20, and the second cycle going from 20 to 200. The main subdivisions between 2 and 20 would run 4, 6, 8, 10, 12, 14, 16, and 18. Between 20 and 200 the subdivisions would run 40, 60, 80, etc.

Ease in using and understanding ratio chart paper is essential to anyone interested in working with time series. *E. R. D.*

The Cycle Round-Up

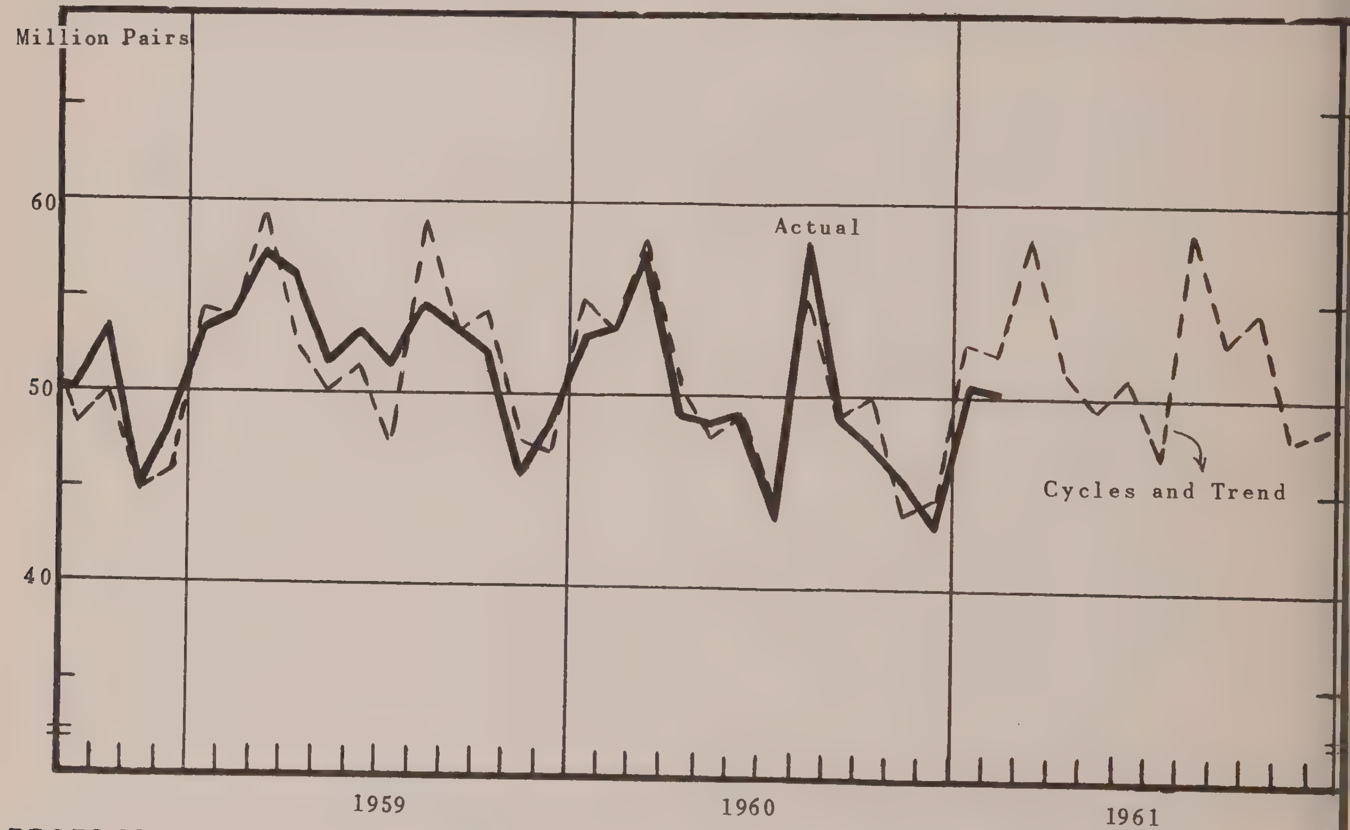
In this issue we review the CYCLES in: ***Shoe Production***
Cotton Consumption
Aluminum Producti

SHOE PRODUCTION

Actual production of shoes and slippers continues to follow the calculated line of cycles and trend in a satisfactory manner. A 12-month and a 27-month cycle are added to an underlying trend to obtain the calculated line. Of the two cycles, the 12-month is dominant, and the double peaks in the cycle (March and August) are plain on the chart. Both cycles, however, represent *average* situations. Some variation between actual experience and the average of the past should be expected, despite the good match between the two lines so far.

The underlying trend to which the cycles are added is extended through 1961 at an average rate of 51.8 million pairs a month. Thi level may be too high. An inspection of the chart reveals what appears to be a genera downward slope since early 1959. As this i being written (April 28), the latest monthl figure available is for February. How well the March peak matches the calculated line will, in part, determine whether or not the tren should be lowered.

If you think the trend level is too high, you can lower the 1961 portion of the calculated line, keeping the contour the same, bu sliding it down to a lower level. *G. S*



PRODUCTION OF SHOES AND SLIPPERS

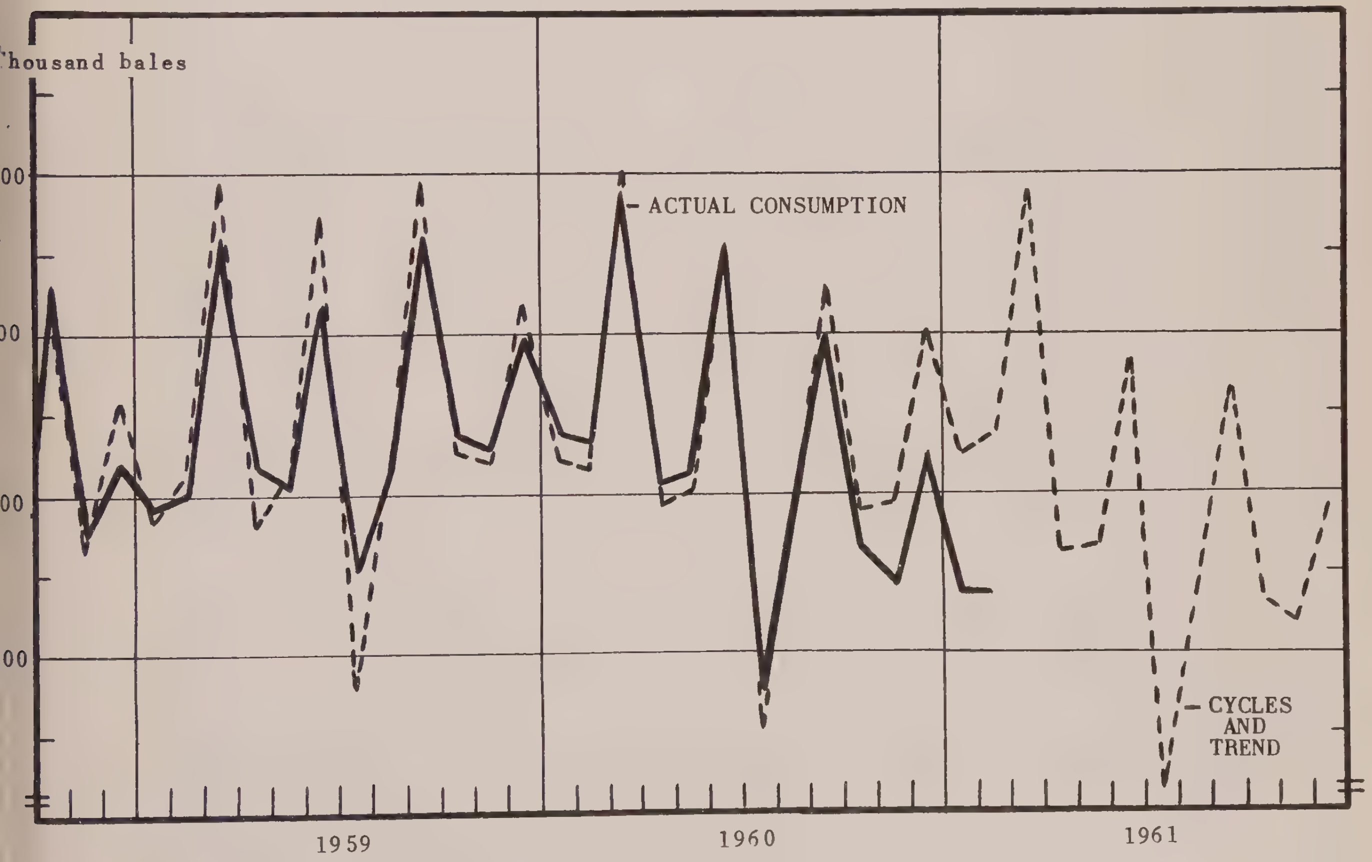
COTTON CONSUMPTION

In the January issue we reported on cotton consumption, using the same chart as is printed below except that four additional months have been added to the chart. At that time, the conclusion was that cotton consumption might decline from 1960 to 1961 because the 23.75-month cycle would be exerting a downward force over the last nine months of the year. In addition, the underlying trend appeared to be going down.

The 23.75-month cycle and the underlying trend (plus the seasonal cycle) account for the broken line on the chart. The last four months' actual cotton consumption has been running lower than suggested by the figures at the time of the last report on the subject. Then, the 1961 yearly total of the months in the calculated line amounted to 8.3 million bales. It now appears that the total for the year may be even lower—perhaps by as much as 500 thousand bales. We have not, however, changed the calculated line as yet.

Actual cotton consumption had a peak period in late 1959 and early 1960. Since then, consumption has been declining steadily during a time when the 23.75-month ideal cycle was rising. This cycle had at *peak* due, on the basis of average past behavior, at February 1961. It is not unknown for actual experience to behave contrary to an average pattern, although, *over the long run*, this cycle will probably operate more often than not. The record on which the average pattern is based goes back through 1923. If World War II is eliminated from consideration, there have been 34 turns on the ideal cycle since 1923. Of these, 24 have been matched by turns in the data. Of course, this means that ten "ideal" turns have not been matched by turns in the data. (The low of February 1960 and the high of February 1961 are included in the count of the 10 that have not matched.) The net is that the odds are 12 to 5 that the cycle will operate at the next turning point, which is a low due at February 1961.

Not until after February 1962 will this cycle again exert an upward force, if it continues to operate. And of course, the cycle operates separately, and in addition to the effect of general business on cotton consumption. *G. S.*



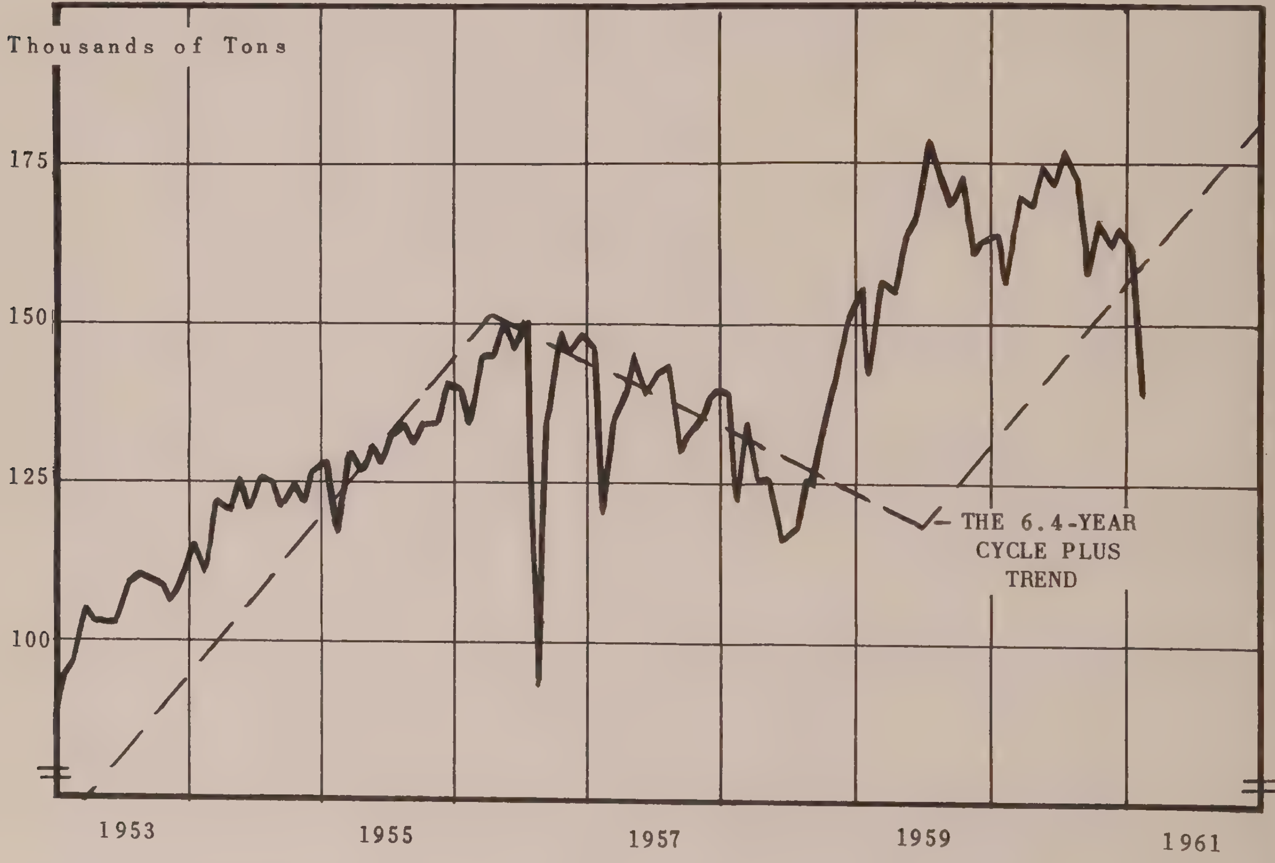
COTTON CONSUMPTION

ALUMINUM PRODUCTION

The average ideal 6.4-year cycle in aluminum production in the United States is now on the way up to an ideal high due in the fourth quarter of 1962. You need to be past the time of the ideal turning point before you can judge the extent to which the cycle has been effective during any particular period. The up-leg of this cycle takes 3.2-years from a low to a high (one-half the cycle length); we are watching a possible 3.2-year move with monthly figures, and this requires a certain restraint. You are apt to be over-impressed by any recent and single but dramatic departure from the general trend, whereas it is only the overall sweep of the actual line during the entire three year period that decides the issue.

The reason I started with the above comment is that February aluminum production dropped to the lowest level since 1958. This is an isolated experience (so far). And, a single month will not materially affect our conclusions after 1962 about whether or not the cycle has been effective this time.

The 6.4-year cycle has had 11 complet repetitions since 1885 when aluminum was firs produced. Of the 11 waves, 10 have been apparent in the data. Usually, however, th cycle declines have been wiped out or greatl minimized by the tremendous growth rate of th industry. The down-legs have been seen mostl as hesitations in the growth trend. The up legs have, on the other hand, been characterized by spurts in production that have carrie the figures to new higher levels. This characteristic spurt during an up-leg did not occu in the up-leg that ended in 1949, but that wa the only time since 1885 that the upward forc of the cycle was not effective. We canno judge as yet whether the current period wil exhibit the same characteristics as the past. Other factors may change the result, but th general effectiveness of this cycle since 188 makes it an important consideration when yo are gauging the possibilities for aluminu production. G. S



DOMESTIC PRODUCTION OF PRIMARY ALUMINUM

THE GEISINGER INDICATOR

Conclusion-neutral: not good; not bad!

The decline in industrial production apparently stopped in January. Production was level for the three months January, February, and March when the Federal Reserve Board's seasonally adjusted Index stood at 155.

The Geisinger Indicator has not as yet signalled "good times ahead" however. In December (August 1961 when advanced) the Geisinger Indicator even declined a little more, to -3.20, to be exact.

The First Difference Indicator (which measures rate-of-change in industrial production) went up in February to -0.83.

The Modified Geisinger Indicator (the sum of the Geisinger Indicator and the First Difference Indicator) went down further in December (August 1961 when advanced) to -5.20.

My reaction to the situation described above is mixed—as the situation is mixed. It is good that the decline in production has halted, and that the First Difference Indicator has therefore turned up slightly. But it is not good that the Geisinger Indicator has not yet made a definite upturn.

So, although there is no reason for undue gloom, there is also no reason, as yet, for solid optimism.

April 26, 1961 E. R. Dewey

P.S. As of today, the Leading Indicators stand 4 good, 1 poor, 3 neutral—a score of +3 out of a possible ±8. E. R. D.

The recent figures:

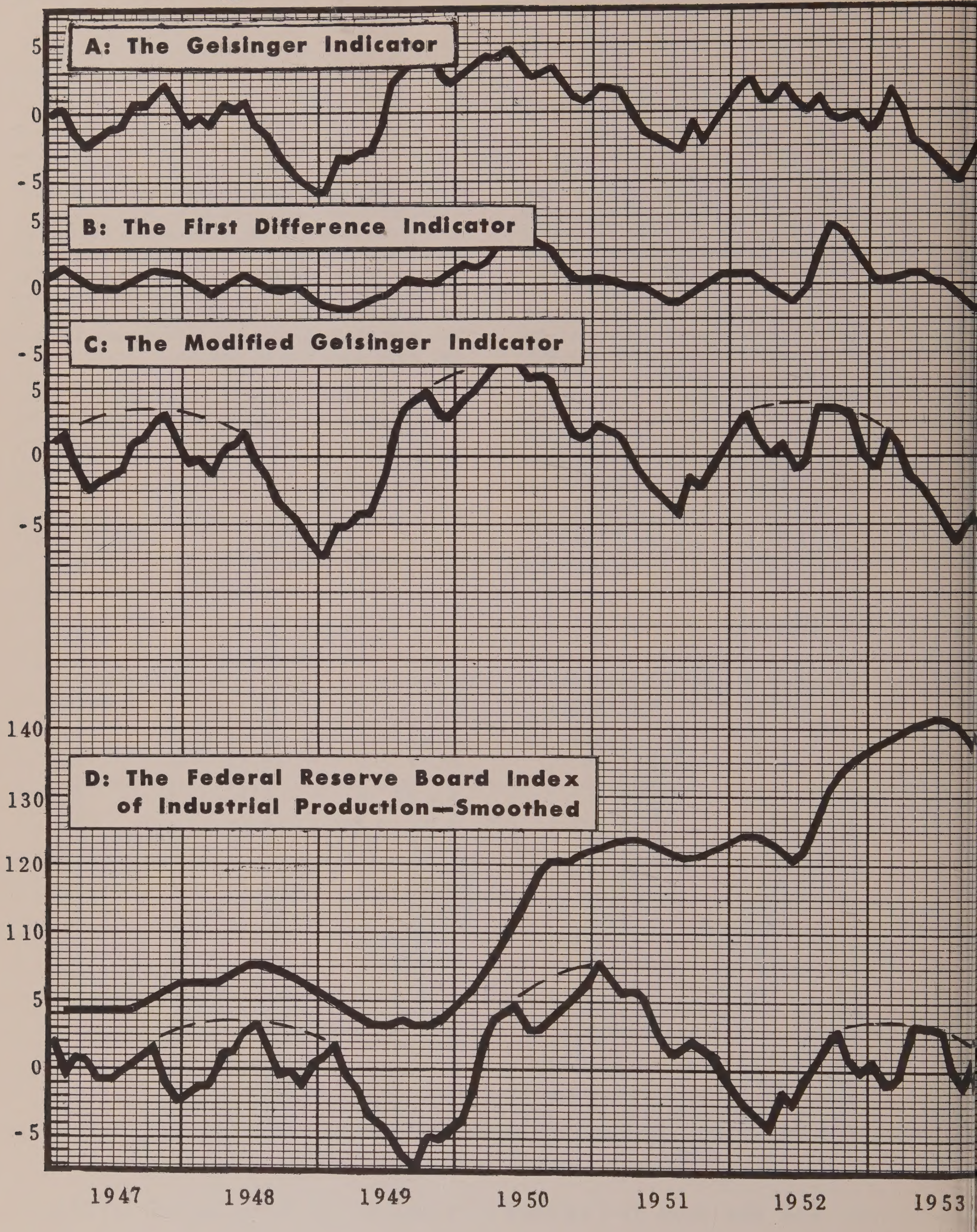
Month	F.R.B. Index	Geisinger Indicator	First Difference Indicator	Modified Geisinger Indicator	Timing Advanced 8 Months
Mar-1960	166	-2.20	-0.33	-2.53	1960-Nov
Apr	165	-2.00	-0.33	-2.53	Dec
May	167	-0.20	0.16	-0.04	1961-Jan
Jun	166	0.20	0.17	0.37	Feb
Jul	166	0.00	-0.17	-0.17	Mar
Aug	165	-2.20	-1.00	-3.20	Apr
Sep	162	-3.00	-1.50	-4.50	May
Oct	161	-2.40	-1.83	-4.23	Jun
Nov	159	-2.60	-2.00	-4.60	Jul
Dec	156	-3.20	-2.00	-5.20	Aug
Jan-1961	155	*	-1.67r	*	Sep
Feb	155	*	-0.83p	*	Oct
Mar	155p	*	*	*	Nov

r - revised; p - preliminary; * - not yet available

For $3 a year extra members can get the Geisinger Indicator text and figures by first-class mail immediately after it is written. This service saves you the two weeks that it takes to print and mail Cycles, plus the two weeks it takes the Post Office to deliver it.

The chart: See the next two pages

The Geisinger Indicator Compared To Indus



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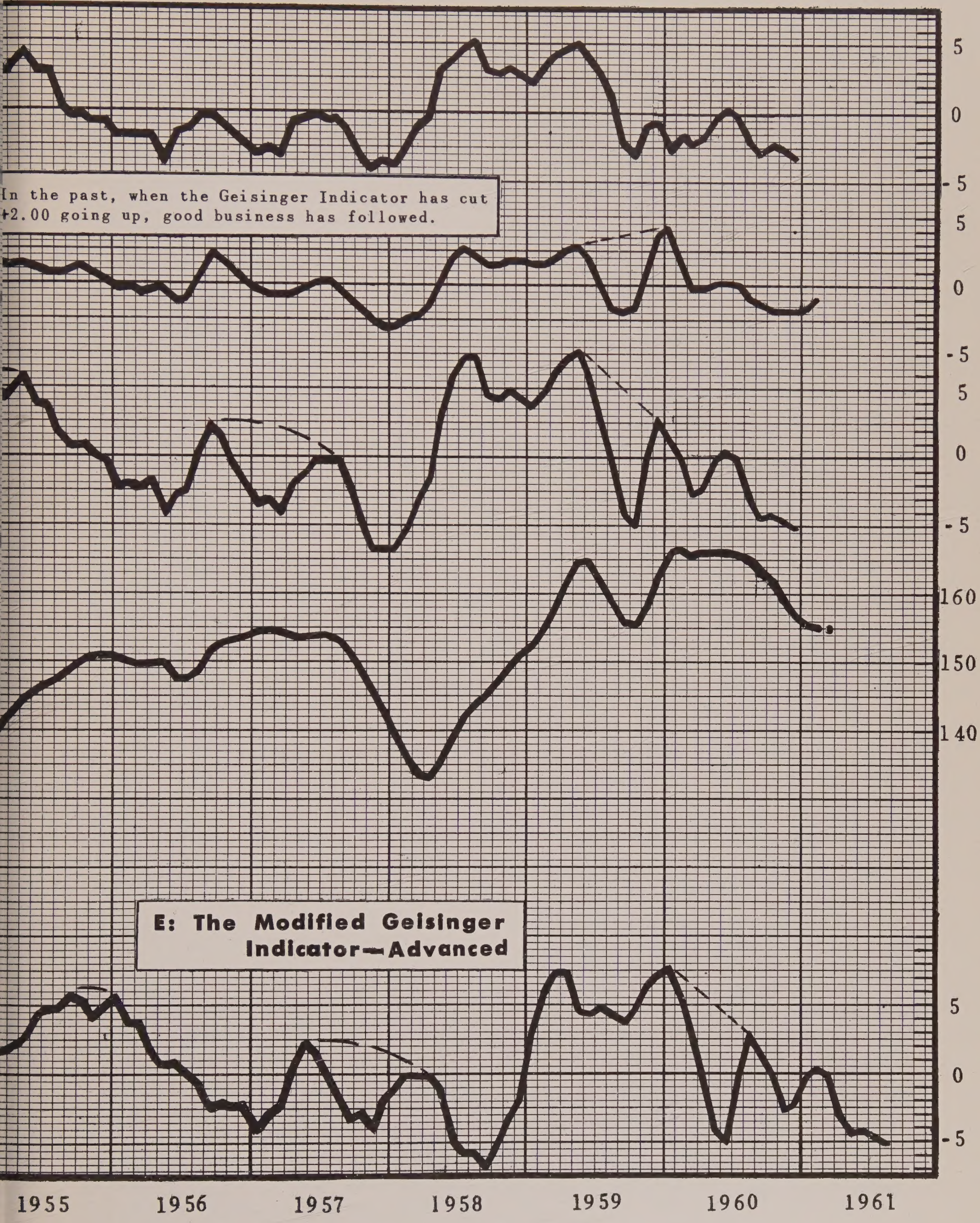

n the past, when the Geisinger Indicator has cut
+2.00 going up, good business has followed.

E: The Modified Geisinger Indicator—Advanced

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